U.S. Department of Transportation
Federal Highway Administration

Communication Strategies for Mainstreaming TSMO

INTRODUCTION

This case study highlights effective communication strategies within departments of transportation (DOTs) to mainstream transportation systems management and operations (TSMO). It provides examples of practices to support recognition of TSMO, build acceptance, and integrate TSMO across agency functions.

TSMO applies operational improvements to maximize transportation system performance of existing transportation facilities and stretch limited funding. TMSO is a set of strategies that enable transportation agencies to implement low-cost solutions, balance supply and demand, provide flexible solutions to meet changing conditions, and benefit more areas and customers. TSMO benefits can include improved safety and reliable traffic flow, which result in reduced congestion, better quality of life, less wasted fuel, cleaner air, and economic advantages.

Raising awareness and motivating change through effective communication is key to mainstreaming TSMO in State DOTs. This case study features a variety of approaches that State DOTs use to introduce their staff to information, concepts, and mechanisms related to TSMO. These approaches include videos, training, case studies, performance reporting, and cross-functional committees.

DEFINITION OF MAINSTREAMING TSMO

Mainstreaming TSMO within an organization makes management and operations strategies readily understood, considered, attractive, and available to relevant agency leadership and staff regardless of where they sit in the organization. Mainstreaming formalizes a TSMO program through comprehensive collaboration among a broad group of transportation management stakeholders (e.g., State and local DOTs, cities, counties, metropolitan planning organizations [MPOs], transit authorities, first responders, law enforcement, and legislators). This allows input based on knowledge, skills, and techniques from individuals in all programs that have a stake in improving the multimodal transportation system. Success in TSMO is not dependent on just one champion.

RATIONALE FOR MAINSTREAMING

Mainstreaming TSMO helps transportation agencies align, rather than compete, across programs to accomplish long-term system performance goals for the transportation system. Mainstreaming TSMO integrates a broader range of strategies throughout transportation departments and related agencies and organizations. It engages planners, designers, operators, and construction and maintenance staff, and it touches all aspects of mobility, including congestion, air quality, sustainability, safety, security, reliability, and related quality-of-life concerns. The goal of mainstreaming is to routinely include TSMO strategies as an equal player to address transportation needs within a community or region, along with other options to improve transportation system performance.

INTERNAL AGENCY COMMUNICATION ABOUT TSMO

This section highlights examples of DOTs that have developed communications materials or State reporting requirements to increase awareness about TSMO within the agency. The agencies featured are the Tennessee Department of Transportation (TDOT), Ohio Department of Transportation (ODOT), and Texas Department of Transportation (TxDOT).

TENNESSEE DEPARTMENT OF TRANSPORTATION

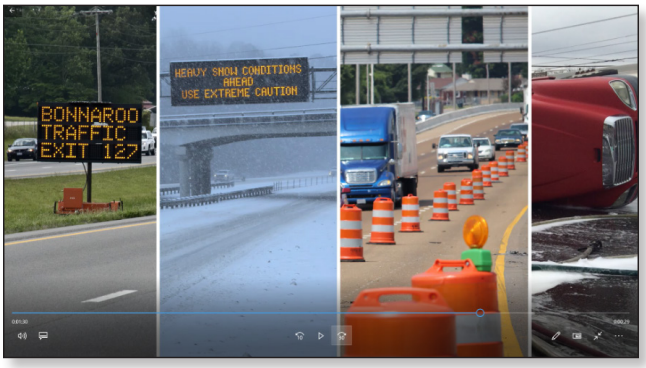
TDOT has a history of strong support for TSMO from agency leadership. This support translated into elevating operations to a division-level organizational unit in 2013, which placed operations on the same level as other transportation disciplines within the agency. This structural change within the DOT supported mainstreaming TSMO by enabling the director of the Operations Division to communicate directly and more frequently with directors of other disciplines within the department. Furthermore, in 2021, TDOT created the statewide TSMO integration manager position (TSMO Manager). The TSMO manager is responsible for facilitating the integration of TSMO practices both internally and with external agency partners, implementing the steps outlined in TDOT's TSMO Program Plan, monitoring probe data to identify bottlenecks statewide, and monitoring emerging technologies that could improve the safety, efficiency, and reliability of TDOT's transportation network.

TDOT is an organization comprising headquarters in Nashville, four region offices geographically split across the State, and a total of 12 district offices that report to the region offices. TDOT headquarters staff provide policy and champion procedures and guidelines to the region and district staffs, who then implement the programs and projects.

TDOT began in 2018 focusing on communications and building relationships with region and district staff for education and awareness of TSMO. TDOT held Regional Operations Forums within Tennessee in each of its four regions to roll out TDOT's Traffic Operations Plan. Several operations directors from TDOT regions also attended a Regional Operations Leadership Forum with other nearby States to develop TSMO leaders and learn about effective TSMO practices and mainstreaming efforts from across the United States.

Source: Tennessee DOT.

Figure 1. Image. Screenshot from Tennessee Department of Transportation (DOT) video defining TSMO.[1]



Source: Tennessee DOT.

Figure 2. Image. Screenshot from Tennessee Department of Transportation video on TSMO strategies.[2]

1 Tennessee DOT. 2018. "TSMO and TDOT ITS," YouTube video, 1:59. https://www.youtube.com/watch?v=y4XpFkUPdnk, last accessed January 12, 2023.

2 Ibid.

TDOT developed a video in 2018 to explain TSMO and highlight the benefits of TDOT's TSMO activities, shown in figure 1 and figure 2. The 2-minute video was posted online for the public. The video highlights that land constraints and funding challenges require TDOT to manage and operate the existing transportation system as efficiently as possible. It mentions a variety of TDOT operations initiatives to reduce congestion and improve safety, such as (1) TDOT video cameras and other roadway devices for providing information to transportation management centers and travelers, (2) the TDOT driver's assistance program, and (3) smart work zones. The video also stresses the importance of coordination and communication internally within the department and externally with other transportation stakeholders to allow them to prepare for the future.

At its annual operations symposium, TDOT presented the video to managers and boots-on-the-ground staff in the areas of operations, construction, and maintenance to explain TSMO and the benefits of TDOT's TSMO activities. The regional operations directors also presented at the symposium, highlighting what they had learned at the leadership forum.

TDOT TSMO leaders have seen success in gaining support for TSMO in the regions, and they continue to focus on communications and relationship building. TDOT developed a new video in 2022 that focuses on creating a general awareness of TSMO at TDOT.[3]

TDOT also published the *TDOT Transportation Systems Management and Operations (TSMO) Program Plan* in February 2022.[4] These activities have helped managers in TDOT regions understand the importance of TSMO and take ownership of promoting it among the staff in the region. These efforts have helped mainstream TSMO across TDOT.

OHIO DEPARTMENT OF TRANSPORTATION

TSMO leaders at ODOT prioritize simple, relatable communications to raise awareness of TSMO and gain support among managers and staff. TSMO has strong executive leadership support at ODOT, and due to its mainstreaming efforts, TSMO is now a core part of how ODOT does business.

To help reach this level of support, ODOT created an online communications toolkit with a video, case studies, infographics, and an interactive timeline of TSMO at ODOT. The video is just under 3 minutes and makes the case for a "new way of thinking."[5] It explains that TSMO leverages what ODOT is already doing to make roads safer and more reliable with technology and real-time data.

The case studies focus on the TSMO solution for a specific need on ODOT roads. The case studies demonstrate how TSMO is different from traditional solutions and provide specific, measurable results. For example, one case study highlights the use of a suite of strategies, including variable speed limits, to improve safety along 12 miles of I–90, which frequently has low visibility in winter.[6] The case study documents a 40-percent reduction in crashes after implementing the TSMO solution.

ODOT TSMO leaders emphasized that finding ways to communicate TSMO simply is one of the most important factors for mainstreaming TSMO. They recommend involving the DOT's communications department or hiring a public relations consultant to ensure simple, nontechnical products.

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3 Tennessee DOT. 2022. "TDOT TSMO Overview," YouTube video, 3:57. https://www.youtube.com/watch?v=hXSbMms0z70&t=2s, last accessed January 12, 2023.

4 Tennessee DOT. 2022. *TDOT Transportation Systems Management and Operations (TSMO) Program Plan*. https://www.tn.gov/content/dam/tn/tdot/traffic-engineering/TDOT_TSMO_Program_Plan_2022_Final.pdf, last accessed January 12, 2023.

5 Ohio DOT. 2018. "What Is TSMO?," YouTube video, 2:54. https://www.youtube.com/watch?v=m4psLHDsqjs&t=94s, last accessed January 12, 2023.

6 Ohio DOT. *Project: I–90 Lake County*, February 15, 2020. https://www.transportation.ohio.gov/wps/portal/gov/odot/programs/tsmo/case-studies/tsmo-case-study-i-90, last accessed February 24, 2023.

TEXAS DEPARTMENT OF TRANSPORTATION

TxDOT uses operations performance measures and internal performance reporting requirements to communicate to its districts the importance of TSMO. As a result of a 2017 memo from the chief engineer, TxDOT began requiring the districts to track and internally report on four traffic management system (TMS) performance metrics:

- TMS asset operational uptime: A measure of how districts maintain their traffic management equipment, viewed by TxDOT as the most critical to improve in the short term
- Incident clearance times: A mobility measure of the TxDOT system, impacted by district incident management performance in collaboration with regional partners
- Level of travel time reliability: A measure of the impacts to the traveling public of nonrecurring events on TxDOT roads and the benefits of using operations strategies such as work zone management, traffic incident management, and traveler information
- TMS system coverage: A measure of the proportion of TxDOT system roads adequately covered with intelligent transportation system (ITS) and communications equipment to manage and operate the roads. This information helps decisionmakers understand where to expand coverage. The typical TMS for TxDOT freeways includes dynamic message signs, closed-circuit television cameras, traffic sensor systems, and the telecommunications networks connecting the devices to the traffic operations center. Other devices may be included as needed such as high-water detection systems.

The first three are priority metrics reported monthly to TxDOT leadership by the districts. The measures are tracked on an internal TxDOT engineering operations dashboard. The fourth metric, TMS system coverage, is reported semiannually to the traffic safety division at TxDOT headquarters by each metro district and El Paso. In semiannual reports, the districts also include their plans for upgrades to TMS deployments in the next 12 months, plus a list of TMS projects included in the TxDOT *Unified Transportation Program*, a programming document that guides transportation projects. By requiring districts to track and report on TSMO-oriented performance metrics, TxDOT is helping to mainstream TSMO throughout its organization.

MAINSTREAMING TSMO THROUGH TRAINING

This section provides examples of how Pennsylvania Department of Transportation (PennDOT) has used training to increase awareness of TSMO. PennDOT focuses on training to mainstream TSMO and gain buy-in from planners and operators at the district level. This buy-in helps to mainstream TSMO across PennDOT by integrating TSMO into the planning and operations activities at the district level.

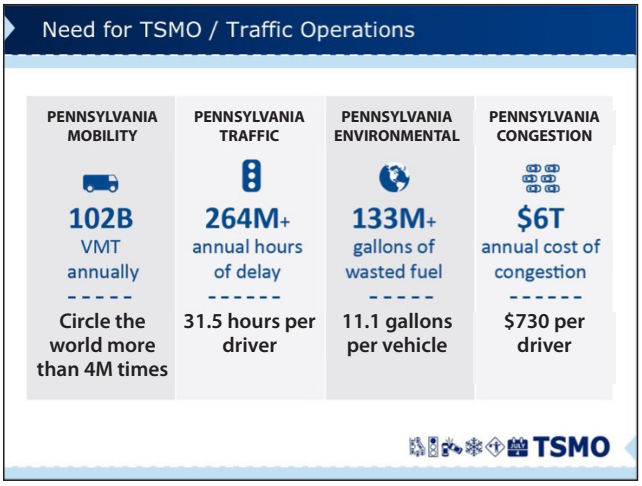
TSMO Training Subcommittee: A TSMO training subcommittee of traffic operations, highway engineering, and safety staff that identifies training needs. The group explores TSMO training available at the national level and identified the need for internal training on the new PennDOT TSMO guidebook series. The training program consists of several subcommittees that focus on various subjects. PennDOT has developed a multitopic traffic academy that includes basic "TSMO 101" courses.

Transportation Management Center (TMC) Boot Camp: PennDOT has created a TMC boot camp that includes a section on TSMO. PennDOT offers the boot camp to operations employees on an as-needed basis. The boot camp provides operators a foundational understanding of TSMO and explains how their roles contribute to successfully implementing TSMO. The TSMO section of the boot camp is led by the TSMO program manager from PennDOT headquarters. It begins by communicating in simple terms the TSMO purpose, vision, and mission (figure 3) and establishes the need for TSMO by highlighting the costs of congestion (figure 4).

TSMO = transportation systems management and operations.

Source: Pennsylvania DOT.

Figure 3. Sample TSMO slide on purpose, vision, and mission in Pennsylvania Department of Transportation (DOT) traffic management center boot camp.[7]



B = billion; M = million; T = trillion; TSMO = transportation systems management and operations; VMT = vehicle miles traveled.

Source: Pennsylvania DOT.

Figure 4. Sample TSMO slide on the need for TSMO in Pennsylvania Department of Transportation (DOT) traffic management center boot camp.[8]

7 Pennsylvania DOT. "Traffic Management Center Boot Camp" presentation. Not published.

8 Ibid.

Guidebook for Transportation Planners: PennDOT's TSMO program developed the first guide in its guidebook series to explain how TSMO fits into the transportation planning process at PennDOT and how to develop operations plans at the regional level. The guidebook is intended for those responsible for planning and operations in Pennsylvania, including MPOs and local agencies. The guidebook helps make the connection between operations, ITS, and congestion-related planning and the overarching transportation planning process. Understanding these connections in turn helps planners support TSMO and incorporate it as a regular part of the planning process, leading to mainstreaming TSMO.

COMMUNICATION ACROSS FUNCTIONS WITH CROSS-DISCIPLINARY COMMITTEES

This section highlights how the Maryland Department of Transportation State Highway Administration (MDOT SHA) and the Washington State Department of Transportation (WSDOT) use cross-disciplinary committees and task forces—important mechanisms for communicating across an agency—to mainstream TSMO across the agencies.

MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION

MDOT SHA's TSMO program is led by a TSMO Executive Committee. The committee is made up of senior management from across MDOT SHA—including Deputy Administrators, Office Directors, and Engineers—and is coordinated by the TSMO Program Manager. This committee, which is chaired by the MDOT SHA Administrator, provides strategic guidance and program governance, helping to promote the TSMO program as a common strategy between planning and operations within the agency.

When the TSMO program launched at MDOT SHA, it was implemented through a working group that included staff from multiple disciplines, offices, and districts within the agency. The TSMO working group provided the platform for TSMO communication and collaboration among organizational elements of MDOT SHA and was responsible for carrying out implementation actions identified in the *TSMO Strategic Plan* by means of several task forces:

- TSMO business process and policy
- Systems and technology
- Data, analysis, and performance measures
- Training and education
- Communications and outreach
- Connected and automated vehicles
- Freight and multimodal

The task forces worked on a variety of activities to help establish an integrated TSMO process. For example, the communications and outreach task force provided in-house outreach and worked to communicate about TSMO to MPO partners, and the training and education task force developed TSMO curriculum and tailored the content to different groups within the organization.

The MDOT SHA TSMO Program Manager facilitated integration of the agency's TSMO strategy within MDOT SHA offices and programs. Once a majority of the initial actions were implemented, the TSMO working group integrated TSMO efforts into existing meetings and platforms. The group also integrated the TSMO concept across existing maintenance, operations, planning, and other meetings as a theme that should be included in regular meetings and activities as part of doing business. As a result, the MDOT SHA TSMO working group dissolved; however, the Executive Committee continues to meet regularly to move forward in mainstreaming TSMO and showcasing leadership involvement and support for the concept.

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION

Another example of a multidisciplinary TSMO group is WSDOT's TSMO Program Plan Council. The council began meeting in early 2020 and includes WSDOT staff from the areas of design, construction, maintenance, planning, freight, asset management, performance management, and safety. The council guides the development of WSDOT's TSMO program plan as a cross-functional plan that is more than a list of TSMO projects, and it answers the question, "How do we plan, fund, and operate our facilities from an integrated, multimodal, multijurisdictional perspective?"[9] This planning also includes looking for TSMO solutions that will advance the agency's Environmental Justice focus. The council hopes to mainstream TSMO across WSDOT by effectively creating TSMO liaisons in several divisions. These liaisons can apply what they learn from the TSMO council to work in their own offices.

9 Washington State Department of Transportation. "TSMO (Transportation Systems Management and Operations)" (website). https://wsdot.wa.gov/operations/traffic/tsmo, last accessed June 28, 2021.

SUMMARY

The agencies highlighted in this case study all recognized the importance of communications in raising awareness of TSMO and garnering support for integrating TSMO into other agency functions. The agencies' approaches to communication included:

- Cross-disciplinary committees that bring together managers and staff from some of the most critical areas for mainstreaming TSMO (e.g., planning, project development, maintenance, and safety)
- Short, simple videos communicating the meaning of TSMO and its value for the organization
- Operational performance reporting requirements for districts
- Case studies that showcase how TSMO is different from the traditional approach
- Participation in operations forums that extend beyond the agency
- Training that is tailored specifically for different divisions within an agency
- Directives and other messages from agency leadership requiring the consideration of TSMO

Transportation agencies can use these approaches and others to mainstream TSMO across their geographic and functional divisions such that TSMO is recognized and applied for maximum benefit to transportation systems.

NON-BINDING CONTENTS

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